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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/600,037	OREN, YAIR	
	Examiner	Art Unit	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. **Claim 1** is objected to because of the following informalities:

The portion beginning, "a head-end coupled to," may be intended to begin, "a head-end node coupled to."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1, 15, 17, and 22** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The subject matter in question is the following limitation introduced in Paper No. 14, filed on 24 December 2003:

> wherein a terminal node and another terminal node communicate with each other only through said head-end node via respective separate communication channels (claims 1, 15, 17, and 22, emphasis Examiner's).

In support of this limitation, Applicant cited the following portion of Applicant's specification:

> "As discussed in more detail below, head-end and terminal nodes 24, 26 provide for coupling client system (not shown) to ring 22 for communication over virtual star network 20. Each terminal node 26 has a separate communication channel 28 over network 20 to head-end 24 but does not have a direct communication channel to any other terminal node 26. Each terminal node 26 sends all network traffic from its connected client systems to head-end node 24, which effects a cross-connection function and sends to each terminal node 26 the network traffic intended for it. Network 20 thus implements a virtual star over a physical ring, with head-end node 24 as the star's logical center, or hub, and terminal nodes 26 as the star's logical points" (Paper No. 14, p. 11, middle paragraph, citing Applicant's specification, p. 8, l. 15-23, emphasis Examiner's).

Applicant's limitation claims the relatively narrow scope of two nodes communicating with each other only through a head-end node. That is, the limitation appears to claim the scope of each node lacking any communication channel to any other node, except for those channels that include the head-end node. Applicant's specification only supports the relatively broader scope of each node lacking a direct communication channel to any other node. For example, the specification does not exclude any indirect, inter-node communication channels that do not include the head-end node. In view of such an example, Examiner notes that Applicant did not possess the claimed limitation at the time the invention was made. As a possible remedy, Examiner suggests adjustment to the claim language to more closely reflect the source text of the specification.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 1-2, 4, and 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Elrefaie ("Multiwavelength survivable ring network architectures").

Regarding claim 1, Elrefaie discloses:

A system for communicating between a plurality of nodes coupled to an optical wavelength division multiplexed ring network comprising:

a first terminal node (Office #1 in Fig. 6) having a communication subsystem (Figs. 1-3 or 7) configured to be coupled to the ring network to receive and to transmit signals at a first (λi) wavelength and to permit signals at other wavelengths to pass, a tributary subsystem (not shown, but conventionally included as interface means between offices in Fig. 6 and local customers' equipments, Official Notice) configured to be coupled to a plurality of devices (local customers' equipments, Official Notice) to enable the devices to communicate over the ring network, and a multiplexing subsystem (ADM in Fig. 7) coupled to the tributary subsystem

(interface means to local customers' equipments, Official Notice) and to the communication subsystem (Figs. 1-3 or 7) to channel signals between the plurality of devices and the ring network;

a second terminal node (Office #2 in Fig. 6) having a communication subsystem (Figs. 1-3 or 7) configured to be coupled to the ring network to receive and to transmit signals at a second (each office is assigned a unique wavelength, p. 1246, col. 2, 2nd paragraph) wavelength and to permit signals at other wavelengths to pass, a tributary subsystem (not shown, but conventionally included as interface means between offices in Fig. 6 and local customers' equipments, Official Notice) configured to be coupled to a plurality of devices (local customers' equipments, Official Notice) to enable the devices to communicate over the ring network, and a multiplexing subsystem (ADM in Fig. 7) coupled to the tributary subsystem (interface means to local customers' equipments, Official Notice) and to the communication subsystem (Figs. 1-3 or 7) to channel signals between the plurality of devices and the ring network; and

a head-end (Hub Office in Fig. 6) coupled to the ring network to receive and to transmit signals at both the first and second wavelengths, the head-end node having a demultiplexer (input WDMs in Fig. 8) to isolate signals received at the first and second wavelengths, an integral cross-connect module (SONET ADMs in Fig. 8) to determine an output wavelength at which to transmit received signals based on address information (such address information is a conventionally known means, Official Notice) included in the received signals, and a multiplexer (output WDMs in Fig. 8) to combine the received signals for transmission on the ring network at the first and second wavelengths;

wherein said first terminal node and said second terminal node communicate with each other only through said head-end node via respective separate communication channels (section 4.1, p. 1246, col. 2 – p. 1247, col. 1, note discussion on consolidated switching).

Elrefaie does not expressly disclose:

the first and second nodes each having a tributary subsystem of configured to be coupled to a plurality of devices to enable the devices to communicate over the ring network.

However, Examiner takes Official Notice that nodes in WDM ring networks like those of Elrefaie typically have such tributary subsystems. Though not shown, such tributary subsystems are conventionally included as interface means between offices in Fig. 6 and local customers' equipments. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include such a tributary subsystem in the first and second nodes of Elrefaie. One of ordinary skill in the art would have been motivated to do this so that local customers' equipments have the ability to access the WDM ring network; without this ability, local customers lack the ability to communicate across the WDM ring network.

Elrefaie also does not expressly disclose:

the integral cross-connect module (SONET ADMs in Fig. 8) to determine an output wavelength at which to transmit received signals *based on address information included in the received signals.*

However, Examiner takes Official Notice that performing such determining *based on address information included in received signals* is a conventionally known means in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to base this determining on address information included in the received signals of Elrefaie. One of ordinary skill in the art would have been motivated to do this since address information included in signals conventionally determine the destination office, and each destination office is assigned a unique wavelength for receiving these signals from the head-end (p. 1246, col. 2, 2nd paragraph, p. 1247, col. 1, 1st paragraph). In other words, there is a clear

correlation between the address of the destination office and the wavelength of the destination office.

Regarding claim 2, Elrefaie discloses:

The system of claim 1, wherein the first and second communication subsystems include an optical add/drop multiplexer (Figs. 1-3 or 7) coupled to the ring network.

Regarding claim 4, Elrefaie discloses:

The system of claim 1, wherein the terminal nodes and head-end node receive and transmit signals using a synchronous optical network communication standard (SONET in Fig. 7).

Regarding claim 11, Elrefaie discloses:

The system of claim 1, wherein the head-end node includes first and second transmitters (transmitters in SONET ADMs for each ring, Fig. 8, p. 1246, col. 2) coupled to the multiplexer to send signals at the first and second wavelengths, respectively, and first and second receivers (each SONET ADM terminates two fibers to receive, Fig. 8, p. 1246, col. 2) coupled to the demultiplexer to receive signals at the first and second wavelengths, respectively.

Regarding claim 12, Elrefaie discloses:

The system of claim 1, wherein the ring network includes a first ring for transmitting information in a clockwise direction (working ring in Fig. 6) and a second ring for transmitting information in a counter-clockwise direction (protection ring in Fig. 6), the first communication subsystem (Office #1, Fig. 7) comprises a pair of transceivers (each ADM has two transmitters and terminates two fibers for transmit and receive, p. 1246, col. 2, 2nd paragraph) coupled to the first and second rings, respectively, the second communication subsystem (Office #2, Fig. 7) comprises a pair of transceivers (each ADM has two transmitters and terminates two fibers for transmit and receive, p. 1246, col. 2, 2nd paragraph) coupled to the first and second rings, respectively, the demultiplexer comprises a pair of demultiplexers (input WDMs in Fig. 8)

coupled to the first and second rings, respectively, and the multiplexer comprises a pair of multiplexers (output WDMs in Fig. 8) coupled to the first and second rings, respectively.

Regarding claim 13, Elrefaie discloses:

The system of claim 12, wherein the first communication subsystem further includes a selector (p. 1246, col. 2, 2nd paragraph) that compares a pair of signals received by the pair of transceivers and selects a signal from the pair of signals based on a quality parameter of each signal.

6. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Elrefaie as applied to claim 1 above, and further in view of Jahromi (U.S. Patent No. 5,416,768).

Regarding claim 3, Elrefaie discloses all the limitations of claim 3 except:

wherein the head-end node includes a tributary subsystem configured to be coupled to a plurality of devices to enable the devices to communicate over the ring network.

However, Jahromi discloses such a tributary subsystem (Jahromi, 8xSTM-1 Tributary Units and STM-1 TRIB in Fig. 13). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement such a tributary subsystem in the head-end node of Elrefaie. One of ordinary skill in the art would have been motivated to do this so that the head-end node of Elrefaie could be "a gateway node for local, regional and national network traffic" (Jahromi, col. 10, lines 33-46).

7. **Claims 5-8, 17-19, and 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Elrefaie as applied to claim 1 above, and further in view of Armitage et al. ("Design of a Survivable WDM Photonic Network").

Regarding claim 5, Elrefaie discloses:

The system of claim 1, wherein the head-end node receives and transmits signals using a synchronous optical network communication standard (SONET in Fig. 7).

Elrefaie does not expressly disclose that:

a subset of the signals further use a communication protocol framed by the communication standard, the head-end node includes at least one protocol subsystem to determine address information for the communication protocol, and the head-end node is configured to send signals using the communication protocol to the at least one protocol subsystem.

However, it is a well-known technique to use a protocol framed by the communication standard. While Elrefaie teaches a standard (SONET), Armitage et al. teaches the use of protocols (Armitage et al., ATM or IP, p. 244, col. 2, middle paragraph) that can be framed by this same standard (ATM cells or IP packets in SONET frames). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange a subset of the signals of Elrefaie to further use a communication protocol framed by the communication standard. One of ordinary skill in the art would have been motivated to do this since they enable an additional layer of network protection and restoration (Armitage et al., middle of abstract, section "Design Protection" on p. 247+, and middle of col. 2 on p. 251).

Also, as a part of this combined protocol and standard usage, Armitage et al. teaches nodes (Armitage et al., nodes in Fig. 1) configured to send signals using the communication protocol(s) (ATM or IP) to protocol subsystems (Armitage et al., switches/routers in Fig. 1) that switch/route signals according to the signals' address information (not shown, but ATM cells and IP packets conventionally have address information) for the communication protocol. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement these node teachings of Armitage et al. in the head-end node of Elrefaie. One of ordinary skill in the art would have been motivated to do this since the head-end node of Elrefaie already contains the switching/routing means for the system of Elrefaie; such switching

consolidation is already in line with the switching consolidation teachings of Elrefaie (p. 1246, col. 2, 1st paragraph).

Regarding claims 6-7, Elrefaie in view of Armitage et al. discloses:

The system of claim 5, wherein the communication standard is one of SONET and SDH (SONET in Fig. 7), and

(claim 6) the communication protocol is IP (Armitage et al., p. 244, col. 2, middle paragraph), or

(claim 7) the communication protocol is ATM (Armitage et al., p. 244, col. 2, middle paragraph).

Regarding claim 8, Elrefaie in view of Armitage et al. discloses all the limitations of claim 8 except:

wherein the communication protocol is IP encapsulated within ATM.

However, Examiner takes Official Notice that IP over ATM is another conventional communication protocol with advantages and disadvantages over the other communication protocols disclosed by Armitage et al. (ATM and IP). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ IP over ATM in the system of Elrefaie in view of Armitage et al. One of ordinary skill in the art would have been motivated to do this to provide yet another alternative communication protocol, thus increasing design flexibility to the system of Elrefaie in view of Armitage et al.

Regarding claims 17-19 and 21, claims 17-19 and 21 are system claims that correspond largely to coherent combinations of the limitations in system claims 1 and 5-8. Since all these claims are rejected under Elrefaie in view of Armitage et al., all the limitations of system claims 17-19 and 21 are found in Elrefaie in view of Armitage et al. Additionally, Elrefaie in view of Armitage et al. coherently teaches the limitations in claims 1 and 5-8. That is, the limitations in claims 1 and 5-8 are not divergently taught under Elrefaie in view of Armitage et

al. Therefore, the recited means in the coherent combination of the limitations in claims 1 and 5-8 read on the corresponding means in system claims 17-19 and 21.

Claims 17-19 and 21 also include limitations absent from claims 1 and 5-8. Elrefaie in view of Armitage et al. also discloses these limitations:

at least some of the nodes (Elrefaie, Offices in Fig. 6) sending and receiving signals using at least one secondary communication protocol (Armitage et al., p. 244, col. 2);

at least one protocol subsystem coupled (Armitage et al., p. 244, col. 2) to the cross-connect module;

the at least one secondary communication protocol includes ATM (Armitage et al., p. 244, col. 2), and further includes IP encapsulated within ATM (see treatment of claim 8 above).

Regarding claim 22, claim 22 is a method claim that corresponds largely to a coherent combination of the limitations in system claims 1 and 5. Since all these claims are rejected under Elrefaie in view of Armitage et al., all the limitations of system claim 22 are found in Elrefaie in view of Armitage et al. Additionally, Elrefaie in view of Armitage et al. coherently teaches the limitations in claims 1 and 5. That is, the limitations in claims 1 and 5 are not divergently taught under Elrefaie in view of Armitage et al. Therefore, the recited means in the coherent combination of the limitations in claims 1 and 5 read on the corresponding steps in method claim 22.

Claim 22 also includes limitations absent from claims 1 and 5. Elrefaie in view of Armitage et al. also discloses these limitations:

determining destination address information (Armitage et al., not shown, but ATM cells and IP packets conventionally have address information that is read by ATM switches and IP routers); and

retransmitting (Elrefaie, p. 1246-1247, bridging paragraph) signals received at the head-end node at one of the first and second wavelengths based on the destination address

information (Elrefaie, address information included in signals conventionally determine the destination office, and each destination office is assigned a unique wavelength for receiving these signals from the head-end (p. 1246, col. 2, 2nd paragraph, p. 1247, col. 1, 1st paragraph); in other words, there is a clear correlation between the address of the destination office and the wavelength of the destination office).

8. **Claims 9-10 and 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Elrefaie in view of Armitage et al. as applied to claim 5 above, and further in view of Lea (U.S. Patent No. 6,115,373).

Regarding claim 9, Elrefaie in view of Armitage et al. discloses all the limitations of claim 9 except:

a second subset (Lea, Fig. 2) of the signals further use a second communication protocol (Lea, ATM or IP in Fig. 1), the head-end node includes a second protocol subsystem (Lea, ATM controller 4 or IP controller 5 in Fig. 1) to determine address information for the second communication protocol, and the head-end node is configured to send signals using the second communication protocol to the second protocol subsystem (Lea, col. 3, lines 37-45).

However, Lea teaches the second set of protocol-related limitations, as indicated above. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate this second set of protocol-related teachings of Lea in the system of Elrefaie in view of Armitage et al. One of ordinary skill in the art would have been motivated to do this "to provide a network architecture that integrates IP and ATM into a single architecture keeping the best features of both" (Lea, col. 2, lines 10-12).

Regarding claim 10, Elrefaie in view of Armitage et al. and Lea discloses:

The system of claim 9, wherein the first communication standard is one of SONET and SDH (Elrefaie, SONET in Fig. 7), the first communication protocol is IP (Lea, Fig. 1), and the second communication protocol is ATM (Lea, Fig. 1).

Regarding claims 17-20, claims 17-20 are system claims that correspond largely to coherent combinations of the limitations in system claims 1 and 9-10. Since all these claims are rejected under Elrefaie in view of Armitage et al. and Lea, all the limitations of system claims 17-20 are found in Elrefaie in view of Armitage et al. and Lea. Additionally, Elrefaie in view of Armitage et al. and Lea coherently teaches the limitations in claims 1 and 9-10. That is, the limitations in claims 1 and 9-10 are not divergently taught under Elrefaie in view of Armitage et al. and Lea. Therefore, the recited means in the coherent combinations of the limitations in claims 1 and 9-10 read on the corresponding means in system claims 17-20.

Claims 17-20 also include limitations absent from claims 1 and 9-10. Elrefaie in view of Armitage et al. and Lea also discloses these limitations:

at least some of the nodes (Elrefaie, Offices in Fig. 6) sending and receiving signals using at least one secondary communication protocol (Lea, Fig. 1); and

at least one protocol subsystem coupled (Lea, Fig. 1) to the cross-connect module.

9. **Claims 14-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Elrefaie, as applied to claim 12 above, and further in view of Wu et al. ("Feasibility Study of A High-Speed SONET Self-Healing Ring Architecture in Future Interoffice Fiber Networks").

Regarding claim 14, Elrefaie discloses all the limitations of claim 14 except:

wherein the head-end node further includes a selector that compares a pair of signals received by the pair of demultiplexers and selects a signal from the pair of signals based on a quality parameter of each signal.

However, Wu et al. does disclose such a selector (Wu et al., 1:2 selector/generator in Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include a selector of Wu et al. in the system of Elrefaie. One of ordinary skill in the art would have been motivated to do this to accept signals from a properly working ring in the case that network components fail (Wu et al., p. 917, col. 2, last paragraph).

Regarding claim 15-16, claims 15-16 are system claims that correspond to coherent combinations of the limitations in system claims 1 and 12-14. Since all these claims are rejected under Elrefaie in view of Wu et al., all the limitations of system claim 15-16 are found in Elrefaie in view of Wu et al. Additionally, Elrefaie in view of Wu et al. coherently teaches the limitations in claims 1 and 12-14. That is, the limitations in claims 1 and 12-14 are not divergently taught under Elrefaie in view of Wu et al. Therefore, the recited means in the coherent combinations of the limitations in claims 1 and 12-14 read on the corresponding means in system claims 15-16.

Claim 16 also includes a limitation absent from claims 1 and 12-14. Elrefaie also discloses this limitation:

a second terminal node having a second selector (p. 1246, col. 2, 2nd paragraph) to select a signal from the pair of signals received by the second pair of transceivers based on a quality parameter of each signal.

Response to Arguments

10. Applicant's arguments with respect to independent claims 1, 15, 17, and 22 have been considered but are moot in view of the new ground(s) of rejection. Note the application of Elrefaie as a primary reference.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Toba et al. is cited to show a related system with the physical topology of a ring and the logical topology of a star. Wagner et al. is cited to show a related system in the form of a ring wherein two nodes communicate with each other only through a head-end node. Zhong is cited to show a related system with the physical topology of a ring and the logical topology of a star wherein a plurality of nodes communicate with each other only through head-end nodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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